

**$\gamma$ -L-Glutamyl-S-(prop-1-enyl)-L-Cysteine in the Seeds of  
Chives (*Allium schoenoprasum*)**

The precursor of the lachrymatory factor, S-(prop-1-enyl)-cysteine sulfoxide<sup>1</sup>, and its  $\gamma$ -glutamylpeptide, (+)- $\gamma$ -L-glutamyl-S-(prop-1-enyl)-L-cysteine sulfoxide<sup>2</sup>, were isolated in this laboratory two years ago. We have now isolated the corresponding peptide with a reduced S-atom from the seeds of chives (*Allium schoenoprasum*). The yield was 1.02 g of crystalline material from 1 kg of seeds. The  $\gamma$ -glutamyl bond in the peptide was established by determining the free  $\alpha$ -amino and  $\alpha$ -carboxyl groups. Glutamic acid and S-(prop-1-enyl)-cysteine were characterized as products of enzymic hydrolysis by a calf kidney preparation. The last mentioned new amino acid could be identified with the reduction product (sodium bisulphite being the reducing agent) of the precursor of the lachrymatory factor. On the other hand,  $\gamma$ -glutamyl-S-(prop-1-enyl)-cysteine sulfoxide was formed when the new peptide was oxidized with hydrogen peroxide.

The configuration of the glutamic acid in the peptide was determined by hydrolyzing the peptide and isolating the amino acid ( $[\alpha]_D^{23} = -35.2$  in 6 N HCl). Cystine, formed on acid hydrolysis, was also isolated ( $[\alpha]_D^{23} = -179$  in 1 N HCl). The new peptide was accordingly  $\gamma$ -L-glutamyl-S-(prop-1-enyl)-L-cysteine.

A more detailed report will be published in *Acta Chemica Scandinavica*.

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**References**

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2. Virtanen, A. I. and Matikkala, E. J. *Suomen Kemistilehti B* **34** (1961) 84, 114.

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